



# **Transthoracic Echocardiogram (TTE) - Single Service**

*Clinical Guidelines for Medical Necessity Review*

**Version:** 2  
**Effective Date:** March 22, 2024

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## Guideline Information:

**Specialty Area:** Cardiovascular Disease

**Guideline Name:** Transthoracic Echocardiogram (TTE) (Single Service)

**Literature review current through:** 3/15/2024

**Document last updated:** 3/22/2024

**Type:**  Adult (18+ yo) |  Pediatric (0-17yo)

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# Care Path Services & Medical Necessity Criteria

## **Service: Transthoracic Echocardiogram (TTE)**

### General Guidelines

- **Units, Frequency, & Duration:** None.
- **Criteria for Subsequent Requests:** None.
- **Recommended Clinical Approach:** Transthoracic echocardiography can be useful for patients with possible cardiac etiology for chest pain or shortness of breath, heart failure, palpitations, arrhythmias, lightheadedness, dizziness, syncope, TIA, stroke, or peripheral embolic event.<sup>1,2</sup> It can also be used for the evaluation of suspected valvular heart disease, pericardial disease, or pulmonary hypertension. Appropriate use criteria for repeat echocardiograms are more stringent than first-time studies.
- **Exclusions:** None.

### Medical Necessity Criteria

#### Indications

- **Transthoracic echocardiogram (TTE)** is considered appropriate if **ANY** of the following is **TRUE**<sup>1-3</sup>:
- ◆ The patient has chest pain (or ischemic equivalent) and clinical evidence of valvular, pericardial, primary myocardial disease, or congenital heart disease; **OR**
  - ◆ The patient has chest pain (or ischemic equivalent) and an additional sign or symptom, including shortness of breath, abnormal ECG, palpitations, TIA, stroke, or a peripheral embolism; **OR**
  - ◆ The patient has syncope or pre-syncope<sup>1</sup>; **OR**
  - ◆ Prior testing (e.g., chest X-ray, ECG, cardiac biomarkers) suggested heart disease or structural heart abnormality; **OR**
  - ◆ There is a suspicion of hypertensive heart disease; **OR**
  - ◆ The patient requires evaluation of right ventricular function with suspected pulmonary hypertension or pulmonary embolism; **OR**
  - ◆ Patient with known or suspected infective endocarditis<sup>4</sup>; **OR**
  - ◆ The patient requires re-evaluation for asymptomatic valvular heart disease with normal left ventricular function, including **ANY** of the following:

- Aortic or mitral regurgitation with **ANY** of the following frequency limitations:
  - The patient has mild disease: no more than one echo every 3–5 years; **OR**
  - The patient has moderate disease: no more than one echo every 1–2 years; **OR**
  - The patient has severe disease: no more than one echo every 6 months to 1 year; **OR**
- Aortic stenosis with **ANY** of the following frequency limitations:
  - The patient has mild disease ( $V_{\max}$  is equal to 2.0–2.9 m/s): no more than one echo every 3–5 years; **OR**
  - The patient has moderate disease ( $V_{\max}$  is equal to 3.0–3.9 m/s): no more than one echo every 1–2 years; **OR**
  - The patient has severe disease ( $V_{\max}$  is greater than or equal to 4 m/s): no more than one echo every 6 months to 1 year; **OR**
- Mitral stenosis with **ANY** of the following frequency limitations:
  - The patient has mild disease (MV area is greater than 1.5 cm<sup>2</sup>): no more than one echo every 3–5 years; **OR**
  - The patient has moderate disease (MV area is 1.0 to 1.5 cm<sup>2</sup>): no more than one echo every 1–2 years; **OR**
  - The patient has severe disease (MV area is less than 1 cm<sup>2</sup>): no more than one echo every 1 year; **OR**
- ◆ The patient has known heart failure and has had clinically significant symptom or treatment changes; **OR**
- ◆ The patient has newly diagnosed LBBB; **OR**
- ◆ The patient has frequent VPC's without other evidence of heart disease; **OR**
- ◆ The patient has nonsustained VT; **OR**
- ◆ The patient has sustained VT, VF, or cardiac arrest; **OR**
- ◆ The patient has a new onset of atrial fibrillation or atrial flutter; **OR**
- ◆ The patient has **ANY** of the following:
  - The patient has any form or degree of conduction disease and clinical evidence of valvular, pericardial, or primary myocardial disease; **OR**
  - The patient has AV block with suspicion of reduced ventricular function at an initial or follow-up evaluation; **OR**
  - The patient has AV Block with abnormal findings (including chest X-ray, ECG, or physical exam) suggesting structural heart disease; **OR**
  - The patient has AV block and a history of congenital heart disease; **OR**

- The patient has any form of conduction disease and an additional sign or symptom including chest pain, shortness of breath, palpitations, TIA, stroke, or peripheral embolic event; **OR**
- ◆ The patient is post-valvular intervention, including **ANY** of the following:
  - In patients with a bioprosthetic surgical valve, TTE at 5 and 10 years and then annually after implantation is reasonable, even in the absence of a change in clinical status<sup>1</sup>; **OR**
  - After valve replacement, female patient planning pregnancy and no TTE within the past year<sup>1</sup>; **OR**
  - Patient with bioprosthetic TAVR and no TTE within the past year.<sup>1</sup>

**Non-Indications**

- **TTE** is not considered appropriate if **ANY** of the following is **TRUE**:
- ◆ Routine echocardiogram in a patient without known cardiovascular disease with no clinical changes; **OR**
  - ◆ Routine echocardiogram for known, asymptomatic valvular heart disease more frequently than listed above; **OR**
  - ◆ Routine echocardiogram in a known heart failure patient without any significant clinical changes, treatment changes that may affect cardiac function, or plans for invasive procedures/device therapy.

**Site of Service Criteria**

Outpatient.

**Procedure Codes (HCPCS/CPT)**

HCPCS Code	Code Description/Definition
93303	Complete transthoracic echocardiography for congenital cardiac anomalies
93304	Follow-up transthoracic echocardiography for congenital cardiac anomalies
93306	Real time transthoracic echocardiography with 2-dimensional (2D) image documentation, M-mode recording with spectral Doppler echocardiography, and color flow Doppler echocardiography

93307	Complete real time transthoracic echocardiography with 2-dimensional (2D) image documentation
93308	Follow-up real time transthoracic echocardiography with 2-dimensional (2D) image documentation
C8921	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, for congenital cardiac anomalies; complete
C8922	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, for congenital cardiac anomalies; follow-up or limited study
C8923	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, real-time with image documentation (2d), includes m-mode recording, when performed, complete, without spectral or color doppler echocardiography
C8924	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, real-time with image documentation (2d), includes m-mode recording, when performed, follow-up or limited study
C8929	Transthoracic echocardiography with contrast, or without contrast followed by with contrast, real-time with image documentation (2d), includes m-mode recording, when performed, complete, with spectral doppler echocardiography, and with color flow doppler echocardiography

# Medical Evidence

Doherty and colleagues (2017) developed a multi-society appropriate use criteria document for multimodality imaging in valvular heart disease. TTE is considered the examination of choice (appropriate) for initial evaluation of asymptomatic patients with any of the following: unexplained murmur, history of rheumatic heart disease, first-degree family history of a bicuspid aortic valve, etc. In the examination of patients with clinical signs and/or symptoms, TTE may be appropriate for arrhythmias and presyncope as well as assessment of volume status in a critically ill patient and established cause respiratory failure. It was found to be appropriate in other instances such as syncope, hemodynamic instability, heart failure, endocarditis with positive blood cultures and respiratory failure. TTE was rated as appropriate for evaluation of valvular mass, stage A valvular heart disease (VHD), mild or moderate VHD, some forms of severe VHD, and valve replacement or repair evaluations. In pre-transcatheter aortic valve replacement (TAVR) evaluation, TTE is deemed appropriate only for assessment and number of valve cusps and degree of calcification, and appropriate during intra and post-procedural evaluations. In mitral valve repair, TTE is deemed appropriate to determine patient eligibility, post procedurally, and may be appropriate for certain intraprocedural evaluation situations.<sup>1</sup>

In the 2011 appropriate use criteria for echocardiography document (American College of Cardiology, American Society of Echocardiography, American Heart Association, et al.) Douglas et al. address the appropriate use of TTE, transesophageal echocardiography (TEE), and stress echocardiography. The application of the 2007 appropriate use criteria were stated to have been evaluated in academic medical centers, Veterans Affairs hospitals, and community settings. It was found that only 11-16% of TTE applications were unclassified, meaning that most TTEs ordered were captured by acceptable use criteria (AUC) indications (87-91%). It was found that the most commonly reported appropriate indications for TTE included initial evaluation of symptoms potentially caused by suspected cardiac etiology.<sup>2</sup>

In a 2011 study, McDermott and colleagues concluded that TTE was a sufficiently sensitive screening test for native valve infective endocarditis for patients with normal heart valves. Additionally, in those patients with abnormal heart valves, a transesophageal echocardiogram (TEE) did not increase the diagnostic yield in 12 out of 15 patients evaluated. 2218 TEEs were reviewed, with 87 having a preceding TTE. Infectious endocarditis was defined as high-grade bacteremia with heart valve vegetation. Patients with pacemakers, defibrillators and prosthetic heart valves were excluded.<sup>4</sup>



## References

1. Doherty JU, Kort S, Mehran R, Schoenhagen P, et al. ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2017 Appropriate Use Criteria for Multimodality Imaging in Valvular Heart Disease. *J Am Coll Cardiol*. 2017;70(13):1647-1672. doi:10.1016/j.jacc.2017.07.732
2. Douglas PS, Garcia MJ, Haines DE, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 appropriate use criteria for echocardiography: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Society of Echocardiography, American Heart Association, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance. *J Am Coll Cardiol*. 2011;57:1126-66.
3. Bennett S, Stout M, Ingram TE, et al. Clinical indications and triaging for adult transthoracic echocardiography: a consensus statement by the British Society of Echocardiography in collaboration with the British Heart Valve Society. *Echo Research and Practice*. 2022;9(5):1-16. <https://doi.org/10.1186/s44156-022-00003-8>.
4. McDermott BP, Cunha BA, Choi D, et al. Transthoracic echocardiography (TTE): sufficiently sensitive screening test for native valve infective endocarditis (IE). *Heart & Lung*. 2011;40(4):358-360. doi:10.1016/j.hrtlng.2010.07.007.

# Clinical Guideline Revision History/Information

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